from, is a series of seven jetties, 22 ft. wide, leaving an intervening space of 32 ft. in width between them and the quay. The object of this is to enable barges to pass on the inner side of the jetties, so that vessels may simultaneously discharge their cargoes into barges on both sides and, at the same time, land goods on the quay. The jetties are equipped with cranes which are able to command the vessel's hold, the inner barges, and the quay. It should be pointed out that a high proportion of the goods brought into the docks at London is conveyed by barge or lighter to their ultimate destination.

The north quay is to be flanked by double-story sheds, of which so far only one is constructed. These are designed in reinforced concrete, with brick panelling. On the south side seven single-story sheds of steel framing with corrugated-iron covering have already been provided.

At the western end of the new dock is a dry dock 750 ft. long with an entrance 100 ft. wide and a depth of water over sill of 35 ft.

Connection between the new dock and the adjoining Royal Albert and Victoria system is made by means of a passage 100 ft. in width.

The King graciously acceded to the request that the new dock should be called the King George V. Dock, and named it accordingly.

Notes.

THE Osiris prize of 100,000 francs has been awarded by the Academies of the Institute of France to Gen. Ferrié, C.M.G., Director-General of French Military Telegraphs, in recognition of his work in the development of wireless telegraphy for war purposes. Gen. Ferrié has been well known as an acknowledged authority on wireless matters for many years, and as the head of the French military wireless telegraph services it fell to him to initiate the whole organisation of the wireless arrangements in the fighting forces of France during a period when greater advances were being made than at any other time in its history. He was responsible for the equipment and working of the famous Eiffel Tower station and for the installation of the powerful station at Lyons in 1917, as well as for the completion of the still more powerful station near Bordeaux commenced during the war by the American Army. Gen. Ferrié had much to do with reducing the thermionic valve from a laboratory appliance to a piece of everyday wireless apparatus and in devising wireless equipment for aircraft, and in earlier days was one of the first successful experimenters with the electrolytic detector. In recognition of his work the honorary degree of D.Sc. has been conferred upon him by the University of Oxford.

SIR ROBERT HADFIELD has expanded his reply to the American deputation of engineers who attended in London to present him with the John Fritz medal into an address of thanks, which has just been printed in the form of a substantial pamphlet with numerous illustrations. The address sketches the services rendered by British and American engineers to the Allied cause during the war, outlines the record of the Institution of Civil Engineers, and gives an account of the members of the American deputation. The movement which has resulted in the establishment of the United Engineering Society of the United States is commended as having brought together a large number of distinct technical institutions, housed them in a common building, and provided a common library, so furnishing an excellent object-lesson in the organisation of scientific and technical effort. A description is then given of Sir Robert's own metallurgical research work, especially in regard to the invention of manganese steel, the alloy which possesses such an unusual combination of mechanical and magnetic properties, and of the alloy of iron and silicon, now so widely employed under the name of "low hysteresis steel" in the construction of transformers and other electrical appliances. The concluding sections of the address deal with the growth of science and the value of research to civilisation, the subject being illustrated by an account of the history of the Royal Society and of some of its more famous fellows. The present occasion is a good one for directing attention to the close bonds which unite men of science and technologists in our own country and in the United States, and to the advantages which are to be derived from an even closer co-operation in the future.

THE council of the Royal Society of Arts has decided that in future the Colonial section of the society shall be known as the "Dominions and Colonies Section."

MR. A. J. BALFOUR has been elected president of the British Academy in succession to Sir Frederic Kenyon. M. Henri Pirenne, past-president of the Belgian Academy, has been elected a corresponding fellow, and Bishop G. F. Browne, formerly Disney professor of archæology in the University of Cambridge, an honorary fellow of the academy.

THE following have been elected as officers and members of council of the North-East Coast Institution of Engineers and Shipbuilders for the session 1921–22:—*President:* Sir William J. Noble, Bart. *Vice-Presidents:* Mr. C. W. Cairns, Mr. A. Laing, Mr. C. D. Smith, and Mr. R. Wallis. *Members of Council:* Mr. B. C. Browne, Prof. C. J. Hawkes, Mr. R. Hinchliffe, Mr. H. Laing, and Dr. J. E. Stead. *Hon. Treasurer:* Mr. R. H. Winstanley.

IN accordance with the provisions of section 2 (6) of the Dyestuffs (Import Regulation) Act, 1920, the President of the Board of Trade has appointed a Committee to advise the Board with respect to the efficient and economical development of the dye-making industry. The members of the Committee are:—Mr. W. J. U. Woolcock, M.P. (chairman), Mr. Percy Ashley, C.B. (Board of Trade), Sir Henry

Birchenough, Mr. W. H. Dawson, Mr. G. Douglas, Mr. E. V. Evans, Dr. M. O. Forster, Mr. L. B. Holliday, Dr. Herbert Levinstein, Prof. G. T. Morgan, Mr. J. Morton, Mr. Max Muspratt, Mr. T. Taylor, Mr. N. Thomas (Admiralty), and Mr. G. S. Witham (War Office). An additional representative of dye-using interests is to be appointed shortly.

The Royal Asiatic Society has decided to celebrate the centenary of the birth of the late Sir Richard F. Burton by the institution of an annual memorial lecture and a medal bearing his effigy. Burton was a pioneer and an explorer of the first rank who studied his fellow-men profoundly, and by his wonderful knowledge of the literature and life of the Arabs did much to bridge the gulf between East and West. His journeys to the forbidden cities of Mecca and Harer will long be remembered as exploits as full of daring as they were of scientific importance. A fund, to be known as the Burton Memorial Fund, has been opened and a national appeal for subscriptions is being made. The hon. secretaries of the memorial fund committee are Dr. F. Grenfell Baker and Mr. N. M. Penzer, and subscriptions should be dispatched to the Manager, the National Provincial Union Bank of England, Union Bank Branch, Oxford.

Emphatic corroboration of recent correspondence in our columns upon the supply and cost of German publications is provided by a letter addressed to the *Times* signed by the Vice-Chancellors of the Universities of Liverpool, Sheffield, and Manchester and the Principals of Armstrong College, Newcastle, and Birmingham University. At each of these institutions the librarians have found it impossible to obtain current German scientific literature by reason of the operation of the Reparations Act. There has been a complete stoppage of delivery through the Customs of books of German origin, while books which have been ordered direct from agents in Germany are delayed for an indefinite period. Even when it has been proved that the order was placed before the present Act came into operation and the 50 per cent. Customs charge has been paid under protest, books are still undelivered. The writers of the letter emphasise the fact that it cannot be regarded as patriotic to cut off from this country all knowledge of scientific progress in Germany; on the contrary, it is to the advantage of our trade and ultimate prosperity to know without delay every addition to knowledge made in Germany as in other countries. German journals of science and other publications devoted to the advance of knowledge cannot be regarded as entering into competition with British journals and books, and vigorous protest is made against the interpretation of the Act by the Board of Trade to include such articles.

The University of Calcutta has published, as the first of its series of anthropological papers, an essay by Mr. Panchanan Mitra on the prehistoric arts and crafts of India. Beginning with stone implements, Mr. Mitra traces their development in the Palæolithic and Neolithic types. Then follows a chapter on cave paintings and carvings, containing much information which will be novel to English readers. These are held to indicate an Indo-Australian culture-contact from the late Palæolithic up to Neolithic times. On the general question of prehistoric arts and crafts the author accepts the view of Dr. Coomarswamy that "to this Mykenean facies belong all the implements of wood-work, weaving, metal-work, pottery, etc., together with a group of designs, including many of a remarkably Mediterranean aspect, others more likely originating in western Asia. The wide extension and consistency of this culture throughout Asia in the second millennium B.C. throw important light on ancient trade intercourse at a time when the eastern Mediterranean formed the western boundary of the civilised world." Thus the veil which has hitherto concealed the origins of ancient Indian culture is being gradually lifted, and the University of Calcutta is to be congratulated on its efforts to extend this knowledge by the aid of native scholars like Mr. Panchanan Mitra.

The second part of Mr. Rhys Jenkins's paper, read before the Newcomen Society, on "The Rise and Fall of the Sussex Iron Industry" deals at some length with the technical aspects of the subject, although the historical material available is somewhat scanty. The ore most commonly used was a clay ironstone occurring in nodules and thin beds towards the bottom of the Wadhurst Clay. It was worked mainly by means of bell pits about 6 ft. in diameter at the top, which widened towards the bottom and were generally shallow, being rarely more than 20 ft. deep. These beds have been worked from Roman times onwards. Mr. Jenkins quotes in full the description of the process of iron-making published by John Ray in 1674. From this it is clear that the ironmasters always mixed together different kinds of ore. The roasting process is first described, and afterwards the method of charging and operating the blast-furnace. The period of six days was called the "Founday," and about eight tons of iron were made in this time. The methods of working the iron at the forge or hammer in the Finery and Chafery are also described. Mr. Jenkins concludes that the industry began to decline during the Commonwealth period, and became extinct about the end of the eighteenth century. He discusses possible reasons for this decay, and concludes that it was due neither to the competition of mineral fuel nor to a failure in the supply of charcoal. He appears to think that it may have been connected with the question of power used for working the bellows of the blast-furnace and the hammer of the forge. Water-power was used for this purpose throughout the country, and the Weald was inferior to, for instance, Shropshire as regards both rainfall and the head of water which could be utilised. The author also considers that foreign competition was more acutely felt in the Weald than in the northern districts.

The June issue of the *Decimal Educator*, a quarterly publication of the Decimal Association, contains much interesting information respecting the progress of the metric system. The introduction of metric weights on the Chinese railways, which is now an accomplished fact, was effected without trouble and has given rise to no complaints. A notice issued recently by the Government of Malta announced that the metric system was to come into force on July 1. It has been made obligatory in dealings with the Customs Department as a preliminary to enforcing its use in general trade in the island. The unsatisfactory manner in which decimals are taught in the United Kingdom is the subject of an instructive article in which it is stated that, although teachers as a body are supporters of the metric system, the accepted methods of teaching arithmetic place the decimal fraction in an unfavourable light by giving unnecessary prominence to conversion sums, and in this way seriously handicap decimal reform. It is urged that so far as possible all reference to vulgar fractions should be omitted from the teaching of decimals, and that the examples necessary to explain the meaning of decimals should be drawn from the metric system and decimal coinage, with an occasional sum involving such British measures or coins as are connected by decimal relations. A useful chart illustrates the progress made in the adoption of the metric system during the last hundred years. The consistently upward trend of the curve and the particularly sharp rise during the past ten years are noteworthy, and indicate that as each new country joins in the competition of international trade its national weights and measures are abandoned and the metric system adopted in preference.

THE National Institute of Agricultural Botany, which was organised with the object of improving the seed supply in the United Kingdom, is now making arrangements to conduct a comprehensive series of yield and quality trials of wheat, oats, and barley, to commence during the season 1921–22. The trials will be carried out on a uniform and scientific system in several parts of the country, and final reports, on which the granting of certificates of merit will be based, will be issued after the harvest of 1924. The trials will be open to all who can show that they have in their exclusive possession new or improved varieties or strains of any of these cereals, and undertake to refrain from placing them on the market previous to the issuing of the final report on their merits, except with the institute's consent. The testing fee will be limited to the actual cost of the trial. Full particulars of the scheme can be obtained from the Secretary, National Institute of Agricultural Botany, 10 Whitehall Place, London, S.W.1.

NOS. 1–9 in vol. vi. (1920) of the Entomological Series published by the Agricultural Research Institute, Pusa, are devoted to a series of papers on the life-histories of Indian Microlepidoptera by Mr. T. B. Fletcher. It is mainly within the last fifteen years that any serious attempt has been made to acquire a knowledge of the species of the small moths which occur in India. In 1889 only 225 had been enumerated, while at the present time 2422 species contained in about 458 genera are known. In spite of this large number, Mr. Fletcher remarks that we are merely beginning to learn what kinds exist in the Indian Empire, where there are still enormous areas absolutely unknown so far as Microlepidoptera are concerned. In this series of papers a great deal of scattered information is brought together in a convenient form, and short accounts are given of the life-histories of a very large number of species. Many of the latter, together with their larvæ and pupæ, are well figured in a series of sixty-eight plates which accompanies the letterpress.

DR. MARJORIE O'CONNELL (Bull. Amer. Museum Nat. Hist., vol. xlii., p. 643, 1920) describes Jurassic ammonites from Viñales, western Cuba, which prove the beds containing them to be of Oxfordian age. The author points out that in a recent paper by Dr. M. S. Roig previous descriptions of Mexican species have become included as though they came from Cuba. More may be expected, however, from Dr. Roig's extensive collections, and Dr. O'Connell will, no doubt, pursue her studies in this almost untouched field.

IN Bulletin 597 of the U.S. Geological Survey, with its large geological map on the scale of 1 : 250,000, Mr. B. K. Emerson provides a handbook to "The Geology of Massachusetts and Rhode Island," a region associated with Boston Bay, one of the most famous natural gateways of North America. Students at Harvard and citizens of Providence in the drowned valley of the Blackstone River, or of Pittsfield across the picturesque and dissected uplands of Berkshire, will welcome this record of the geological history of their States. Fascinating reproductions of the early Dinosaurs of Triassic times are given from models, including Stegomus, known from its armour only, and the bipedal Anchisaurus. The reader requires geological training, but this should not be lacking in the abundant secondary schools of Massachusetts.

SPECIAL interest attaches to a recently published Bulletin of the U.S. Geological Survey on "The Iron and Associated Industries of Lorraine, the Sarre District, Luxemburg, and Belgium," by Messrs. Alfred H. Brooks and Morris F. La Croix. The bulletin gives an exhaustive description of the position in these districts and of their future possibilities, and is full of valuable statistical information most carefully collected. At the moment the following passage, written with reference to the Sarre coalfield, is perhaps the most interesting for British readers:—"It has long been recognised in Germany that the Government mines were less efficiently operated than those in private hands. Evidence of this difference is found in the reported cost of production. The average cost per ton of coal mined in the years 1906 to 1910 was 11.54 francs for the private mines and 13.50 francs for the Government mines. This ratio of cost appears to have continued for 1913, when the average profit, as reported, was 2.50 francs per ton for private mines and 2.15 francs per ton for Government mines, in spite of the fact that the private operators sold their coal cheaper than the Government. . . . Further evidence of the better practice in the private mines is afforded by the annual coal recovery per miner, which in 1913 was 261 tons for private mines and 229 tons for Government mines."

PERTHSHIRE has been fortunate in that on two occasions when there was a fall of meteorites specimens and data of a trustworthy nature have been obtained.

In the latest issue of the Transactions and Proceedings of the Perthshire Society of Natural Science (vol. vii., part 2, 1919–20) Mr. Henry Coates describes fully all the data regarding the occurrence of the meteoritic fall in December, 1917, and the paper contains appendices regarding the fall of 1830, records of distances contained in tabulated form, and a report by Mr. W. F. Denning on the path of the meteor. The author has added eleven illustrations from photographs taken at the time and some diagrams. This part of the number also contains a short paper on the occurrence of the horned pond-weed (*Zannichellia palustris*, Linn.) in Keltie Loch, near Dunning, by Mr. J. R. Matthews.

According to an article in *La Nature* for June 25, the French Navy, during the recovery of materials from many of the vessels sunk during the war, has greatly improved the oxy-acetylene torch of Picard so that it can be used under water. The addition which has rendered this possible is a small bell-shaped vessel surrounding the oxy-acetylene flame, which is kept supplied with compressed air. After the flame is alight and the stream of compressed air established the torch may be plunged into water without being extinguished. If by any accident it was extinguished, it was necessary for the diver to ascend to the air to light it again. Under the auspices of the French Department of Scientific and Industrial Research, M. Corne has recently made a further addition to the torch which makes it unnecessary to ascend to relight it. A tube containing an alkaline metal and an oxidiser is attached to the torch and can be moved to the mouth of the bell. On removing the cap from the end of the tube the chemical action of the water on the mixture produces a flame which relights the torch. The addition has greatly increased the number of underwater uses to which the torch can be put.

The Journal of the Washington Academy of Sciences for April 4 contains two communications which deal with the steps taken by the United States to acquire a better knowledge of the properties and behaviour of the oceans which wash its shores. Under the auspices of the National Research Council a conference of representatives of the nations around the Pacific Ocean was held in Honolulu in August, 1920, to consider what knowledge with regard to that ocean was available and in what directions there was most urgent need of its extension. As a result, it is expected that during the present year several volumes dealing with the scientific exploration of the Pacific will be published. The opportunity afforded by the Ice Patrol of the Atlantic in 1920 was utilised by Mr. A. L. Thuras, of the Bureau of Standards, to test the trustworthiness of the method of determining the salinity of sea-water on board ship by measuring its electrical conductivity. It was found both trustworthy and convenient, and it is proposed to set up a self-recording apparatus based on the method which will give the temperature, density, and salinity of the water.

In a paper read to the Physical Society on June 24 Mr. S. Butterworth discusses the errors due to capacity and eddy-current effects in inductometers. At low frequencies these errors are negligible, but at telephonic frequencies they have to be considered, and in radio-telegraphy the corrections which have to be applied are of the same order as the quantities measured. Making the assumption that the capacity effects in two coils having one end in common can be represented by two condensers shunting each coil and by another condenser joining their free ends, the author obtains formulæ which are in good agreement with experiment. When the secondary e.m.f. induced in a secondary circuit is in exact quadrature with the current in the primary the mutual inductance is "pure." This assumption is made in the proof of the Heaviside and Carey-Foster inductance bridges. The author works out the theory of these bridges on the assumption that the mutual inductance is not pure, but varies with the frequency. Experimental verifications of the theory are given.

In the Journal of the Franklin Institute for May last L. W. Austin describes experiments made to determine the directions from which the atmospheric disturbances noticed in radio-telegraphy appear to come. The main observations were made in the West Indies, California, and Washington. The author concludes that on the Atlantic coast of the United States the disturbances come either from the direction of Mexico or from that of the Allegheny Mountains. On the Pacific coast the disturbances are much weaker and their direction is more variable. They seem to come from centres at much shorter distances, and generally in the direction of mountains. At Bremerton and Astoria most of the disturbances come from the direction of Mount Ranier, a lofty and isolated peak. In Porto Rico the disturbances were mainly of local origin and very diffuse. When they came from the sea there was generally land at no great distance in that direction. When the disturbances increase with increase of wave-length, as at Washington, they come from distant origins; when they vary little with wave-length, as at San Francisco and San Diego, the focus of the disturbance is near at hand. The origin of the disturbances seems to be in the upper atmosphere, probably between masses of air at different potentials. The results obtained indicate that a world-survey of these "static" disturbances would lead to important results.

In electroculture it is customary for the high potential wires to be placed horizontally and parallel to one another above the growing crop. As the number of wires is limited the question arises as to how far the electric force at the ground level is uniform. In a paper to the Physical Society read on June 24 Dr. Chree gives simple formulæ showing how the potential gradient at the surface of zero potential (generally the ground level) depends on the height and spacing of the wires. These formulæ will be of use in practical work. It is probable that a high potential gradient is injurious, and a low potential gradient beneficial in certain cases. It is important therefore to obtain uniformity of conditions, for this should at least make it easier to draw conclusions as to the merits of electroculture. An immediately useful deduction from the author's formulæ is that a very uniform set of conditions can be secured at crop level if the distance between adjacent wires does not exceed the height of the wires above the crop. It has to be remembered, however, that when there is an appreciable excess of ions of one sign in the atmosphere the values of the electric forces will be affected.

IT is well known that Hooke's law of proportionality of force applied and deformation produced holds for solids only so long as the deformation is not large. The same may be said with regard to the corresponding law for the deformation of viscous liquids. In order to discover some more satisfactory form of relation between deformation and force in either case, Dr. P. G. Nutting has made observations of the shear of various materials between parallel plates 5 cm. by 10 cm. in area and 0·2 cm. apart; his results are given in the May issue of the Journal of the Franklin Institute. He finds that in all cases the deformation at a given temperature is proportional to a power of the force which varies for different materials from 0·74 to 3·5. Further, it is proportional to a power of the time of application of the force, which varies for different materials from 0·2 to 0·91, the low value being characteristic of solids and the high one of liquids. Dr. Nutting finds that the new law is applicable in other than mechanical fields. In a dielectric, for example, the electrical displacement is proportional to a power of the applied electric field, which varies from 0·54 for paper to 1·16 for xylene, and also to a power of the time of application of the field, which varies from 0·74 for bakelite to −0·2 for mica. For the best technical insulating materials the power of the force is nearly 1·0 and the power of the time nearly zero.

ABOUT six months ago Lüppo-Cramer published his discovery that phenosafranine has the remarkable property of desensitising photographic plates without interfering with the developable image that has been impressed on them, as in the course of ordinary exposure. We have already referred to this and to the solution that Messrs. Ilford have put upon the market that enables the most sensitive plates to be developed with no more precaution as to the safety of the light than would be necessary if the plates were one two-hundredth, more or less, as sensitive as they are. In the *British Journal of Photography* for June 17 and 24 Messrs. A. and L. Lumière and A. Seyewetz give details of experiments they have made on this subject. They have examined the desensitising action of a large number of other safranines, and find that while several are comparable in this matter to phenosafranine, none show any appreciable advantage to it, except that cresosafranine is more easy to wash out of a gelatine film. Many other organic bodies show a notable, and even useful, degree of desensitising effect, but for general purposes phenosafranine is superior to them all. There appears to be no well-defined relation between the constitution of dyes and their desensitising properties. Phenosafranine does not act merely as a light-filter, for it transmits red and violet, for both of which it desensitises. But if the plate is washed after treatment with the desensitiser, as the dye disappears the original sensitiveness is restored. It is therefore assumed that the dye forms an adsorption complex of much lower sensitiveness than the original silver bromide, and that this complex is unstable enough to be gradually decomposed by water. The authors have also examined plates treated with various typical desensitisers by exposing them in a spectrograph and estimating the loss of sensitiveness to light of different wave-lengths.

THE summer meeting of the Association of Science Teachers was held at Cambridge on July 9. In the afternoon Dr. Aston gave a lecture at the Cavendish Laboratory on "Atoms and Isotopes." Early ideas of the structure of matter, leading up to the formulation by Dalton of the atomic theory, were reviewed, and it was shown that the progress made in chemistry during the nineteenth century, which depended on the exact work done in the determination of atomic weights, had been inspired by Dalton's postulates. In order to explain fractional atomic weights, Crookes had suggested that an element might be a mixture of atoms of varying weight, but this was regarded as unlikely until in 1910 Sir Ernest Rutherford's work on radio-activity showed that various forms of lead obtained by radio-active changes had slightly different atomic weights, though their chemical properties were identical. To these substances Prof. Soddy gave the name of "isotopes." The method of positive-ray analysis due to Sir J. J. Thomson was then utilised. By this means it was found that neon—atomic weight 20·2—was probably a mixture of two isotopes of atomic weights 20 and 22 and after much labour a gas was obtained differing in density by 0·7 per cent. from the original, the experimental error being 0·2 per cent. This was not conclusive, but more exact methods of positive-ray analysis have shown that neon is made up of two constituents of atomic weight 20 and 22 in the ratio of about 9 to 1. Similarly, chlorine has been shown to consist of at least two isotopes of weights 35 and 37, and quite recently they have been separated. The work done shows clearly that the important property of an element is the atomic number or the positive charge on the nucleus of the atom, and it is this alone which determines the chemical properties of the element.

THE Journal of the British Science Guild for June contains an article by Sir Richard A. S. Redmayne on the world-position in relation to coal. Great Britain has been unfortunate in her recent experiences. Prior to the war she exported about 73,000,000 tons of coal *plus* 21,500,000 tons shipped as bunker coal, making 94,500,000 tons, or 32 per cent. of her total output. But in 1919 this total was only 47·3 million tons, 20·6 per cent. of the production. In the present year the figures will doubtless be still more unsatisfactory. Other countries have also produced less coal. The entry of China as a competitor in the coal markets of the West is significant. Oil, it is stated, cannot become a real menace to the coal trade, as the amount available is only one-sixteenth of that needed to displace coal, and much of this is required for other purposes. A summary of addresses delivered at the annual dinner of the Guild by Field-Marshal Sir William Robertson, Col. Sir Ronald Ross, the Very Rev. Dean Inge, the Right Hon. Lord Rayleigh, and the Right Hon. Lord Bledisloe is also included in this issue of the Journal. Sir William Robertson made some illuminating comparisons between military experience of the past and the scientific warfare of the present day. He remarked that the day of the amateur is past, and that those who aspire to exercise Ministerial control over the destinies of this country should attach greater importance to the value of science. The administrative activities of the Guild fill a considerable portion of the issue. Special importance attaches to the report of the Committee on the Utilisation of Science in Public Departments, attention being directed to the position of scientific research workers in regard to tenure of service, salary, superannuation, etc. The attitude adopted by the Scientific Research Department of the Admiralty towards the individual university worker whose researches bear on Admiralty requirements is spoken of with approval.

A FAVOURABLE opportunity of obtaining books in general literature and on scientific subjects in new condition at prices considerably below those at which they were published is presented by Messrs. W. Heffer and Sons, Ltd., Cambridge, in their "Remainder" catalogue (No. 201), which has just been issued. It contains 485 titles, and is worthy of perusal.

THE most recent catalogue of Mr. F. Edwards, 83 High Street, Marylebone, W.1, is No. 416, entitled "Australasia and the South Seas." It gives particulars of some 813 works relating to Australia, New Zealand, Tasmania, New Guinea, and the islands of the Pacific. Some very choice and rare volumes are included.

Our Astronomical Column.

RECENT METEORS.—Mr. Denning writes:—"On July 5 there were two showers in prominent activity, supplying large, slow-moving meteors. The radiants were at $243^\circ+65^\circ$ and $228^\circ+58^\circ$. These positions are some distance east of the radiant point computed for Pons-Winnecke's comet, but it is possible the comet and meteors may be associated, the discordances having been brought about by perturbations. Fireballs were observed at Bristol on July 5 11h. 40m. G.M.T. from radiant $243^\circ+65^\circ$, on July 9 11h. 54m. from radiant $238^\circ+18^\circ$, and 12h. 47m. from radiant $343^\circ+12^\circ$. A well-defined shower of swift, streaking meteors was observed from the latter position on the night of July 9."

ANOTHER PLAN OF CALENDAR REFORM.—Prof. Rene Baire (Dijon) contributes an article to *Revue Scientifique*, 1921, No. 9, in which he points out several drawbacks (chiefly from a statistical point of view) attaching to the proposal to place certain days in each year outside the weekly and monthly reckoning. His plan of evading the difficulty is bold and novel, and consists in shortening the greater number of weeks to six days. A Saturday would occur only on the thirty-first day of the month—that is, five times in the year or six times in leap-year. The months are left nearly as at present, but the missing days of February are supplied. The following is the suggested table:—January 30, February 30, March 31, April 30, May 31, June 30, July 30, August 31, September 30, October 31, November 30, December 31. In leap-year July has 31 days.

The 1st, 7th, 13th, 19th, and 25th days of each month would be Sundays; there would thus be sixty Sundays in the year instead of the present fifty-two or fifty-three. The author seeks to disarm ecclesiastical criticism by pointing to this increased number; he also notes that the feasts of January 1, November 1, and December 25 would always occur on Sunday, while if Easter were fixed to the date April 1 it would be preceded by a Saturday. It is proposed that the additional Sundays should take the place of the present Bank Holidays, thus making the number of working days in the year much the same as at present. While the scheme has some obvious advantages, it is doubtful whether public opinion could be brought to sanction such a revolutionary change.

THE VARIABLE NEBULA IN CORONA AUSTRALIS.—Bulletin 20 of the Helwan Observatory contains a photographic research by the director, H. Knox Shaw, of the variability of this nebula and the neighbouring star R Coronæ Australis. The star magnitudes were deduced by comparison with standard fields at the same altitude, the incidental result being derived that the graph connecting magnitude with diameter of image shows decided curvature in the direction of enlargement of the image of the fainter stars. There are five variables in the field besides R Coronæ, viz. S and T Coronæ, C.P.D. $-37{\cdot}8450^\circ$ (shown by Mr. Innes to be an Algol variable with period just under twenty-six days; a minimum of this star was observed at Helwan in 1915 August 9) and two other stars. Except for the Innes star, the variations appear to be irregular, and Mr. Knox Shaw conjectures that they may be due, wholly or in part, to the absorbing medium which he assumes to cover the whole region, as its star density is distinctly less than that of the neighbouring sky. The variability of the nebula is next discussed. Its structure is shown to be made up of a series of rings and knots, which apparently remain *in situ*, but alter in relative brightness. This is analogous to the behaviour of the nebulosity round Nova Persei, and Mr. Knox Shaw has examined the results to see if there is any connection between the changes of the star R Coronæ and those of the nebula. There is suspicion that the nebular changes follow those of the star at a ten-day interval, but the interruptions of the series of photographs by moonlight render it difficult to confirm this. If correct, and if it be due to an emanation travelling from the star with the velocity of light, the distance of the object would be about 100 light-years. It is pointed out that Hind's and Hubble's variable nebulæ are also near variable stars, and in regions of the sky that give evidence of the intervention of absorbing matter.